

REMARKS

Claims 1-3 are rejected under 35 U.S.C. §103(a) as being unpatentable over each of Numata et al., WO 00/13250, and Numata et al., EP 1 117 145 A1. These references are equivalents. Therefore, the following remarks simply refer to the "Numata" reference.

Initially, applicants note that the Japanese counterpart of the Numata reference is described in the specification of the present application on page 4, lines 7-21.

The present invention is a nonaqueous electrolyte secondary cell in which the positive electrode active substance comprises a mixture of a lithium-manganese composite oxide of the formula $Li_{(1+z)}Mn_2O_4$, where $0 \leq z \leq 0.2$, and a lithium-nickel-cobalt-manganese composite oxide of the formula $LiNi_{(1-x-y)}Co_xMn_yO_2$, where $0.5 < x+y < 1.0$ and $0.1 < y < 0.6$. The nonaqueous electrolyte secondary cell of the present invention in which the positive electrode active substance comprises the above-identified lithium-nickel-cobalt-manganese composite oxide has materially improved power characteristics relative to the prior art as represented by Numata.

Numata discloses a secondary cell which includes a positive electrode active material that is a mixture of a lithium-manganese composite oxide and a lithium-nickel composite oxide which includes $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$, where M is at least one of Co, Mn, Al, Fe, Cu and Sr. The amount of Ni of the lithium-nickel composite oxide of Numata is outside the scope of the amount of Ni of the lithium-nickel-cobalt-manganese composite oxide of the present invention. Moreover, Numata does not describe composition ratios between Co and Mn.

The power characteristics of the nonaqueous electrolyte secondary cell of the present invention resulting from the use of the specified lithium-nickel-cobalt-manganese composite having the recited proportions of Ni, Co and Mn cannot be reasonably predicted from the prior art. The unexpected power characteristics of the nonaqueous electrolyte secondary cell of the present invention are demonstrated by the comparative data in the present application. More specifically, the improved power characteristics are demonstrated by a comparison of the power characteristics obtained in the examples for the following cells. Please refer to the data of Tables 6, 7 and 8.

- 1) Invention cell 4 and comparative cell 2 in Table 6.

Invention cell 4: $x+y=0.6$ Comparative cell 2: $x+y=0.5$

The invention cell wherein the proportion of Ni in $\text{LiNi}_{(1-x-y)}\text{Co}_x\text{Mn}_y\text{O}_2$ is smaller than 0.5 specifically exhibits improved power characteristics.

2) Invention cell 0 and comparative cell 1 in Table 6.

Invention Cell 0: $y=0.2$ Comparative cell 1: $y=0.1$

The data for these cells show that even if the proportion of Ni in $\text{LiNi}_{(1-x-y)}\text{Co}_x\text{Mn}_y\text{O}_2$ is smaller than 0.5, improved power characteristics are not exhibited in the case where the proportion of Mn is equal to or smaller than 0.1. In contrast, the invention cell wherein the proportion of Mn is greater than 0.1 specifically exhibits improved power characteristics.

3) Invention cell 8 and comparative cell 3 in Table 7.

Invention cell 8: $y=0.4$, $x+y=0.6$

Comparative cell 2: $y=0.4$, $x+y=0.5$

As with the two cells in (1) above, the invention cell of this case wherein the proportion of Ni is smaller than 0.5 also specifically exhibits improved power characteristics.

4) Invention cell 12 and comparative cell 4 in Table 8.

Invention cell 12: $y=0.5$, $x+y=0.6$

Comparative cell 4: $y=0.6$, $x+y=0.8$

The data for these cells show that even if the proportion of Ni in $\text{LiNi}_{(1-x-y)}\text{Co}_x\text{Mn}_y\text{O}_2$ is smaller than 0.5, improved power characteristics are not exhibited in the case where the proportion of Mn is equal to or greater than 0.6. In contrast, the invention cell wherein the proportion of Mn is smaller than 0.6 specifically exhibits improved power characteristics.

The comparative data in the specification of the present application and, particularly, the comparative data discussed above are sufficient to rebut any *prima facie* obviousness supported by the Numata reference. Removal of the 35 U.S.C. § 103(a) rejection is believed to be in order and is respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated July 17, 2003, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of

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time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,

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